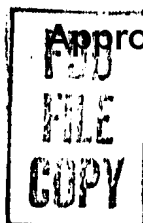


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~~UNCLASSIFIED~~ INFORMATION ON SOVIET  
BLOC INTERNATIONAL GEOPHYSICAL COOPERATION  
- 1960 1 OF 1



INFORMATION ON SOVIET BLOC INTERNATIONAL GEOPHYSICAL COOPERATION - 1960

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INTERNATIONAL GEOPHYSICAL COOPERATION PROGRAM --  
SOVIET-BLOC ACTIVITIES

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## I. GENERAL

### Hungarian Geophysicist Notes IGY Discoveries

Scientists throughout the world are now processing the research data of the International Geophysical Year. On the basis of findings so far, Lajos Bartha, Hungarian geophysicist and astronomer, said that previous ideas about the Earth will have to be changed. According to the new observations, the previously noted thawing of ice fields has now ended. According to Bartha, another interesting finding is that the weight of the Earth increases by about 14 million tons per year because relatively slow moving cosmic dust does not burn up, but is deposited on the surface of the Earth. The Earth is turning more slowly too, and the length of the day is increasing by one hundred thousandth of a second. ("Earth Turning More Slowly" Budapest, Magyar Nemzet, 15 Nov 59, p 3)

## II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

### Theory of Relativity Applied to Satellites

Relativistic perturbations in the motion of an artificial Earth satellite are considered. Einstein's field equations are applied for forming the law of motion, and the rotation of the Earth is taken into account. The equations of motion of the satellite are investigated by the method of variation of elements. It is shown that secular relativistic perturbations are absent in the major axis, the eccentricity, and the inclination of the orbit to the Earth's equator. Secular effects have been found in the longitude of the nodes, the forward motion of the major axis, and the time of perigee passage. ("Relativistic Effects in the Motion of an Artificial Earth Satellite," by A. F. Bogorodskiy, Astronomical Observatory, Kiev University; Moscow, Astronomicheskii Zhurnal, Vol 36, No 5, Sep/Oct 59, pp 883-889)

### Hungarian-Estonian Observatories to Cooperate in Sputnik Tracking

At the invitation of the Hungarian Academy of Sciences, Jean Einasto, astronomy candidate and director of the satellite tracking station in Soviet Estonia, has spent considerable time in Hungary. According to the article, he said that Hungarian astronomers have sent much valuable data to the Soviet tracking center. The visual method developed by Ivan Alamar is very interesting..."

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In the future, the article explains, Hungarian astronomers will play a larger role in tracking satellites. A measurement of the vacillation in the brightness of the artificial satellites is very important, and this can be done only through joint effort. In the interest of this, the Tartu [Estonia] and the Szabadsaghegy [Budapest] observatories will co-operate. ("Cooperation Between Tartu and Szabadsaghegy Observatories"; Budapest, Magyar Nemzet, 3 Nov 59, p 3)

#### Hungarians Receive Signals From Third Soviet Cosmic Rocket

Hungarian astronomers and space experts, upon learning of the time selected for the transmission of signals from the third Soviet cosmic rocket, began hurried preparations. Scientific workers at the Urania Observatory are reported to have built a special antenna in 4 days with which they succeeded in receiving the signals from the Soviet space rocket at 0930 hours Hungarian time. ("Soviet Space Station Relays Photograph of Unknown Side of the Moon"; Budapest, Magyar Nemzet, 20 Oct 59, p 3)

### III. UPPER ATMOSPHERE

#### Hungarians Report Soviet Television-Telescope Used to Photograph Mars

Workers at the Pulkovo Observatory in Leningrad have succeeded for the first time in photographing 8th and 9th magnitude stars. The photographs were made by the television-telescope at that institute which was originally designed to photograph the surface of the Moon. The 8th and 9th magnitude stars are made visible on the picture screen of the telescope to a degree which could be achieved only by an optical telescope having a focal length of one kilometer. Last year, when Mars was near the Earth, the telescope was also used to make photographs of that planet. ("Photographing Stars With a Television Telescope"; Budapest, Muszaki Elet, 12 Nov 59, p 8)

#### Hungarian Ionosphere Research Apparatus

A new, fully automatic device developed in Hungary is said to be capable of measuring the actual distance of the ionospheric layers from the Earth and their behavior for various frequencies. The apparatus records all daily and yearly changes occurring in the ionosphere plus

disturbances connected with the course of sunspot cycles and with granulations and flares. This recording is carried out so that it can be reproduced. The apparatus, incorporating a total of 150 electronic tubes and controlled by a built-in clock, consists of a main apparatus (weight 450 kilograms) and a separate control desk (weight 200 kilograms) which permit observation of the automatic recording of the processes in the ionosphere. ("Fully Automatic Ionosphere Research Apparatus"; Berlin, Die Technik, Vol 14, No 9, Sep 59, p 624)

#### IV. METEOROLOGY

##### Book on Method of Making 3-7 Day Weather Forecasts

A method of forecasting synoptic processes for 3-7 days is described in the book Metodika Sostavleniya Prognozov Pogody Na 3-7 Dney (Method of Preparing 3-7 Day Weather Forecasts) by Yuriy Borisovich Khrabrov. The method is based on an analysis of peculiarities in the evolution of a high planetary frontal zone in synoptic periods. Recommendations for weather forecasts along the paths of cyclones and anticyclones with different high planetary frontal zones are given.

The book is intended mainly for meteorologists and synopticians, but it is also of interest to a wider circle of readers interested in long-range weather forecasting. (Metodika Sostavleniya Prognozov Pogody na 3-7 Dney, by Y. B. Khrabrov; Moscow, Branch of the Publishing House of the Hydrometeorological Service, 1959, 182 pp)

##### Collection of Articles on Long-Range Weather Forecasting

A collection of articles by workers of the weather service of local administrations of the Hydrometeorological Service has been published under the title Sbornik Rabot po Sinoptike (Collection of Works on Synoptics), by the Moscow Branch of the Publishing House of the Hydrometeorological Service.

The first four articles are devoted to problems of spring and autumn frosts in relation to synoptic processes causing them and to specific physical-geographic conditions. Certain prognostic signs are explained which permit forecasting the appearance of frosts 3-5 days beforehand.

The remaining articles give data on the variability of the mean monthly temperatures for Eurasia, consider the synoptic seasons and seasonal anomalies of air temperatures for the cold months of the year in Eastern Siberia, and examine the periods of the warm months of the year with surplus and deficit precipitation on the Kol'skiy peninsula.

This collection of articles is intended for meteorologists, agricultural meteorologists, and synopticians. (Sbornik Rabot po Sinoptike, No 3, edited by Kh. Kh. Rafailovoy; Moscow, Branch of the Publishing House of the Meteorological Service, 1959, 152 pp)

#### Book on Atmospheric Transparency and Visibility

Prozrachnost' Atmosfery i Vidimost' (Transparency of the Atmosphere and Visibility), by Valentin Aleksandrovich Gavrilov, is a pocket-book type brochure designed to acquaint the reader with the principles of studies on the visibility of objects and lights with the aid of an analysis of the interrelation between the properties of the atmosphere, the objects, and the visual functions.

The state of the art and the modern method of instrumental measurement of atmospheric transparency in the main network of hydrometeorological stations are described, as are the principles of determining the landing [airplane] visibility during the day and night in the network of the aerometeorological stations.

The material is presented on the basis of the current state of the problem.

The book is intended for a wide circle of readers interested in the problems of visibility and can also be useful to meteorologists, flyers, and sailors. (Prozrachnost' Atmosfery i Vidimost', by V. A. Gavrilov; Leningrad, Publishing House of the Hydrometeorological Service, 1959, 167 pp)

#### V. SEISMOLOGY

##### Seismic Research in Slovakia

The Geophysics Institute of the Czechoslovak Academy of Sciences is currently conducting investigations of seismic tremors in southern and eastern Slovakia. At present, plans call for the erection of a permanent seismic station southeast of Zilina. This special station will be under the jurisdiction of the Slovak Academy of Sciences.

According to the article, eastern Slovakia still remains unexplored. ("Research of Earthquake Regions in Slovakia"; Prague, Obrana Lidu, 19 Oct 59, p 2)

## VI. ARCTIC AND ANTARCTIC

### Fifth Antarctic Expedition

The Fifth Soviet Antarctic Expedition is not taking with it any new types of equipment, with the exception of new instruments for the study of ozone. However, much is being done to improve the working conditions of polar scientists wintering in Antarctica. The new sleds for sled-tractor trains have improved, new devices to facilitate travel on the ice sheet. For the first time, the station Vostok and the crews of sled-tractor trains will be supplied with protective masks for electrically heated inhaled air. The electric power for these masks, which were made by the Arctic and Antarctic Institute, is provided by portable batteries of considerable capacity.

The work of explorers in the field will be made much safer by the use of gas-analyzing devices. These instruments will protect the people from the danger of poisoning by products of incomplete gas combustion in the heating installation of the field tents.

The expedition plans to take several tons of soil from a hothouse combine for the purpose of building hothouses with electric heating in Mirnyy. Attempts will be made to grow onions and dill in Antarctica. ("Fifth Assault on Antarctica" Leningradskaya Pravda, 27 Oct 59)

### Transantarctic Expedition on the Way

The sled-tractor train of the continental expedition set out from station Komsomol'skaya on 6 November 1959, headed for the south geomagnetic and south geographic poles.

Several members of the Fourth Soviet Antarctic Expedition are taking part in their traverse. The scientific group includes A. Kapitsa, S. Ukhov, L. Khrushchev, N. Kazarin, and Prof B. Savel'yev, members of the glaciological team. The train consists of three "Kharkovchanka" vehicles and two caterpillar tractors. They tow ten sleds loaded with over 400 tons of diesel fuel, provisions, and various equipment.



Measurements of the ice thickness will be made along the way and observations will be made to determine the nature of the subglacial relief and volume of ice. As a result, the Soviet scientists will be able to summarize the data obtained by Soviet and foreign expeditions in previous reconnaissance studies of the whole antarctic ice sheet.

At present, the train is about 300 kilometers from the south geomagnetic pole. Progress is greatly hindered by loose snow. On 14 November the train was able to advance only 11 kilometers. The temperature is about minus 40 degrees centigrade.

During the past few days, an Li-2 plane piloted by B. Osipov landed at Vostok; this was the first plane to arrive after the antarctic winter. ("On the Way to the Pole," Moscow, Vodnyy Transport, 17 Nov 59)

#### Soviet Geographic Names in Antarctica

"List of Geographic Names of East Antarctica," prepared by the Complex Antarctic Expedition of the USSR, was recently published. The list includes more than 750 mountains, bays, and islands which were originally discovered, or whose location on the map was defined more exactly, by Soviet polar explorers. A bay and an island are named in honor of Ivan Kmara, the 20-year-old tractor driver who died heroically in 1956, during the landing of the Soviet expedition on Pravda Coast.

Cape Nikolay Buromskiy, Yevgeniy Zykov Glacier, Aerologist Chugunov Glacier, Academician Obruchev Mountains, and Pravda Coast: these Russian names on the map of Antarctica will always be a reminder of the enormous contribution of the Soviet people to the study and assimilation of Antarctica. ("Soviet Names on the Map of Antarctica," Moscow, Izvestiya, 19 Nov 59)

#### Polish Scientists Travel With Soviet Expedition

A group of Polish scientists will travel to Antarctica with the Fifth Soviet Antarctic Expedition. The Poles will conduct scientific work at the station Oasis, which was turned over to the Polish People's Republic by the Soviets. The station has been renamed "Dobrowolski." ("Fifth Antarctic Expedition," Moscow, Vechernyaya Moskva, 28 Oct 59)

Study on Meteorological Regime of East Antarctic Interior

A study of the Meteorological regime of the interior regions of eastern Antarctica, based on the materials of observations conducted at station Vostok-I, is made by V. G. Aver'yanov. The published data collected by other Soviet intracontinental stations for 1956-1958 are, as far as possible, also used.

The main peculiarity of the meteorological regime of these interior regions and the climate as a whole is the extreme low air temperatures during all the seasons of the year, observed nowhere else. This distinctive feature is explained by the radiation regime of the southern polar region. Data on temperatures, humidity, air pressures, wind velocities, etc., are given.

The material presented indicates the predominating influence of the polar anticyclone on the ground layer of the air over the interior of eastern Antarctica. This creates the basic anticyclonic type weather with its characteristic low temperatures, brightness, dry air, and prevalence of down-slope winds. The cooling action of the anticyclone is intensified in relation to the distance inland. Frequent flows of baric depressions from the direction of the ocean on the antarctic plateau are always accompanied by an increase in air temperatures, intensification of the wind swinging from left to the east, and an influx of stratus clouds and precipitation.

Without diminishing the role of the radiation factor, it is emphasized that the weather and climate of the interior regions of eastern Antarctic are formed as a result of the complex interaction of two basic dynamic systems. Since the meridional transfer of warm air masses into the depths of the continent is not excluded here, the weather also takes on an unstable character, with noticeable fluctuation of the basic meteorological elements. The role of the antarctic anticyclone, which is dominant in this interaction, determines the extreme dry characteristics of the climate of the continent's interior.

The study makes it possible, according to Aver'yanov, to define the climate of the high-altitude plateau as an independent type climate. ("Meteorological Regime of the Interior Regions of Eastern Antarctica," by V. G. Aver'yanov; Leningrad, Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva, Vol 91, No 5, Sep/Oct 59, pp 397-409)

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